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EXAMINER

BAREFORD, KATHERINE A

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 03/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/914,657

Applicant(s)

MAENPAA ET AL.

Examiner

Katherine A. Bareford

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-17, 19 and 21-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

The amendment of Jan. 26, 2004 has been received and entered.

#### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 31, 2004 (with the compliant amendment filed Jan. 26, 2004) has been entered.

#### *Claim Objections*

2. Claim 16 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 14 as worded now requires "a plurality of drying units" to be controlled by the system. Claim 16 requires "at least two drying units". This would be encompassed by claim 14 as worded, which would require "at least two drying units" in order to have a plurality.

The amendments of Jan. 26, 2004 do not remove this problem, nor does the amendment specifically discuss this objection. As a result, the objection is maintained.

*Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 14-17, 19 and 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fay et al (US 4087568) in view of WO 98/41805 (hereinafter '805).

Fay teaches a method for controlling drying effect of an equipment layout used in making a coated web. Figure 1 and column 2, lines 1-35. The coated web can be paper. Column 2, line 65 through column 3, line 5. The equipment layout includes a coater unit and a drying unit. Figure 1 and column 2, lines 55-65. A liquid containing coating is applied to a surface of the web in the coater unit. Figure 1 and column 2, line 55 through column 3, line 5. The coated web is dried in the drying unit by evaporating the liquid from the coated web until a moisture content of the web reaches a desired final moisture value. Figure 1 and column 2, lines 55-65 and column 3, lines 5-65. (note that the measured basis weight is directly based on the moisture content of the web). For the drying unit an evaporation/drying rate model is provided for computing the amount of liquid removed by the drying unit. Column 2, lines 55-65 and column 3, lines 5-65 (see the computation of % VA which is directly proportional to liquid removed, and note that drying rate would be equivalent to "evaporation rate" since the rates are based on liquid

removed by heating). This is linked to/corresponds to the composite evaporation/drying rate model, because only one drying unit is provided, so the model for one is also the composite model for all. The needed evaporation/drying rate to be preformed by the equipment layout to achieve the desired final moisture value is determined. Column 2, lines 1-25. The needed evaporation/drying rate for the drying unit is also determined based on this determination of the equipment layout. The evaporation/drying rate is controlled based on the determined needed moisture evaporation effect. Column 2, lines 1-25.

Claim 15: one drying unit is controlled with the composite evaporation rate model. Column 2, lines 1-25 and column 3, lines 5-65. The claim does not actually require any other drying unit to be present.

Claim 17: Fay teaches a basis weight of the web attained after drying the web with the drying unit is measured. Figure 1 and column 3, lines 5-65 (note BW3). The final basis weight is a measure of the final moisture content as well. See column 3, lines 10-20. The measured basis weight is compared with the desired final basis weight. See the requirements of column 2, lines 1-25. The moisture evaporation rate for the drying unit is controlled with the composite evaporation rate model. See the requirements of column 2, lines 1-25,

Claim 19: Fay teaches that the initial moisture content of the web can be measured prior to entering the first/only coater unit. See figure 1 and column 3, lines 55-65. The amount of liquid applied to the web in the applying step can be determined. See column 3, lines 5-65 (the measurement of the basis weight of the web before and after coating, and the computation of % VA). The evaporation rate of the drying unit is controlled based, at least in part, on the

measured initial moisture content, the determined amount of liquid applied and the composite evaporation model. See column 3, lines 5-65.

Claim 23: Fay teaches that any needed change in the overall moisture evaporation effect is allocated among the drying units. Column 2, lines 1-25 (since there is only one drying unit, all changes go that drying unit).

Fay teaches all the features of these claims except (1) the at least two drying units controlled by the composite model and submodels (claims 14, 16), (2) using an output from one evaporation rate submodel of a drying unit as an input value to a next drying unit (claim 22), (3) using an output from one submodel as an input value for a preceding unit (claim 24, 25), (4) the use of subsystems each of a coater and dryer (claim 25, 26), (5) the specific moisture content measuring (claims 17-19) and (6) the stepwise control (claim 21).

However, '805 teaches that when coating a paper web, more than one dryer can be provided after the coater. Abstract and figure 1. The residual moisture of the web can be checked at various points. Abstract and figure 1. Specifically, the moisture of the web can be checked after coating and before drying (monitor 21) and also checked at the outlet of the drying units (monitor 23). See the abstract and figure 1. One or more of the dryers can be adjusted to provide a web with the desired residual moisture. Abstract and figure 1. For example the final dryer stage can be adjusted. See the abstract.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fay to provide more than one dryer and control them using the composite model with subsystems as suggested by '805 with an expectation of desirable coating results, since Fay

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teaches coating and drying with control of the dryer to provide the desired moisture content in the web and '805 teaches that when coating and drying with multiple dryers the dryers can be controlled interdependently to provide the resulting desired moisture content. As to using the output from moisture content measurements in a feed forward or feed back pattern (claims 22, 24), it would have been obvious to provide adjustments in both directions so as to optimize the results in the quickest fashion, given the desire for efficiency and the continuous adjustments on the web shown by the references. As to the use of coating systems with multiple coater/dryer combinations, it would have been obvious to one of ordinary skill in the art to modify Fay in view of '805 to provide integrated control of such a system when providing more than one coating in series on a web, since Fay in view of '805 provides the suggestion of integrated control, and when providing a series of coatings on the web, with desired final moisture content, further control would be repetitive of what is taught by the combination of references. It would further have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fay in view of '805 to specifically measure the moisture contents of the web and use that value for calculations with an expectation of desirable coating results, because Fay teaches to control the moisture content of the web through control of the residual volatiles in the dried web and further teaches the measurement of basis weight which is directly proportional to moisture weight of the web, and thus the use of moisture weight as the measurement would result in calculations directly proportional to those provided by Fay. It further would have been obvious to one of ordinary skill in the art to modify Fay in view of '805 to provide stepwise changes with an expectation of desirable coating results, because Fay specifically teaches a process based on controlling the drying

unit based on measurements, and each new measurement would result in a specific individual recalculation and adjustment, which would provide stepwise control/adjustments. As to not using as an input into the composite model a measured amount of liquid removed by an individual drying unit of the equipment, this would be suggested by '805, which teaches that a residual moisture monitor can desirably be provided at the outlet of all the drying stations. As a result, '805 suggests measuring the liquid removed by all of the dryers, not an individual dryer, when using more than one dryer, and then adjusting the system based on these measurements. Therefore, when using the process of Fay with more than one dryer as suggested by '805, it would be desirable to only use a measurement of the final residual moisture in the web after all drying occurs to adjust the model, without needing to measure specific results of individual dryers.

### *Response to Arguments*

5. Applicant's arguments filed Jan. 26, 2004 have been fully considered but they are not persuasive.

#### **Applicant's Arguments**

Applicant argues that these amendments to the claims overcome the objections and rejections of the claims raised in the Office Action of June 6, 2003.

#### **The Examiner's Response**

The Examiner has reviewed the above arguments, however, the rejection is maintained as in the 35 USC 103 rejection above. The claims have been primarily amended to indicate that the moisture evaporation rate is controlled in accordance to the determined needed moisture



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evaporation effect without using a measured amount of liquid removed by an individual drying unit while such a drying unit is drying the web. However, as to this issue, as discussed in the 35 USC 103 rejection above, this would be suggested by '805, which teaches that a residual moisture monitor can desirably be provided at the outlet of all the drying stations. As a result, '805 suggests measuring the liquid removed by all of the dryers, not an individual dryer, when using more than one dryer, and then adjusting the system based on these measurements. Therefore, when using the process of Fay with more than one dryer as suggested by '805, it would be desirable to only use a measurement of the final residual moisture in the web after all drying occurs to adjust the model, without needing to measure specific results of individual dryers.

The Examiner has provided a further abstract of '805, which discusses monitors 21 and 23.

### *Conclusion*


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:30-4:00) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (571) 272-1415. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

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Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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